A STUDY OF PERSISTING AND NON PERSISTING STUDENTS IN SELECTED VOCATIONAL-TECHNICAL PROGRAMS AT OKLAHOMA STATE TECH

By

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CHAPTER I

INTRODUCTION

Oklahoma State University School of Technical Training at Okmulgee has an average attrition rate of approximately 13 percent of the student body each trimester. The number of nonpersistent students combined with projected decreases in college enrollment and increased recruitment competition among institutions has concerned the school's administration and staff. Some factors which are relevant in establishing the scope of the problem are as follows.

According to Venn (34) the number of technical programs offered in the United States has more than tripled since 1965.

Henderson (13), in the June 1977 volume of the American Council on Educations Policy Analysis Service Reports projected that there will be 3.6 million 18 year-olds in the United States in 1985 which is 600,000 less than the 1975 figure of 4.2 million.

Noel (20), in a review of recent studies on attrition, reported that out of every ten students enrolling, six will fail to get the ultimate degree for which they aspire. This represents an overall dropout rate from Higher Education of about 60 percent. He also indicated that most of the dropouts leave without formal recognition for their efforts, and many have a sense of disappointment and even resentment. This is evident in the number of students who leave school without officially withdrawing through proper channels.

These factors combined with the concern of the administration over students who leave school early resulted in emphasis being placed on the identification of and consultation with potential nonpersisters. It was hoped that if an early identification system for potential nonpersisters could be developed, it would allow the focusing of student consultation on those students who could profit most from the services.

Statement of the Problem

The problem with which this study is concerned is that of student attrition: the lack of information relating to the early identification of potential nonpersistent students, the development of models for the purpose of identifying potential nonpersistent students, and the validation of prediction models.

Need for the Study

It is important to both Oklahoma State Tech and the students of the institution that the number of nonpersistent students be reduced. The administration and staff have a difficult task in identifying student problem areas, providing student services, and meeting the industrial demands for large numbers of well qualified technicians. To meet these demands it is necessary for an institution to utilize all available resources and explore various methods of meeting the educational needs of the students. The needs of the potential nonpersistent student cannot be met unless he can be identified early enough to be effectively counseled. It is also important to identify these students since the school has committed its educational and financial

resources in their recruitment and enrollment of these students on the premise that they will continue in their program of study until graduation.

Purpose of the Study

The purpose of this study was to test a method of early identification of beginning students with a high probability for leaving Oklahoma State Tech during their first year. The individuals included in this study were beginning students enrolled in Air Conditioning and Refrigeration, Accounting, Business Data Processing, Electrical-Electronic Technology, and Technical Drafting and Design programs of study for the fall and spring trimesters of the 1977-1978 academic school year.

A questionnaire developed by Heiserman (12), School of Technology, Oklahoma State University, was adapted and utilized as the instrument to identify potential nonpersistent students. This study covers the adaptation of the questionnaire, how and when it was administered, and interpretation of student responses. Models utilized in the Heiserman Study were applied to determine their effectiveness in identifying potential nonpersisters. Then the models were adapted and additional models formulated based on the responses to all of the questions on the questionnaire and to certain selected questions. These models were then employed to identify potential nonpersisters in a group of new students enrolled for the fall trimester of 1977 and continuing through the spring trimester of 1978. The most effective models were then used in a validation study to identify nonpersisters in a second group of beginning students during the spring trimester of 1978.

CHAPTER II

REVIEW OF LITERATURE

Representative literature judged to be relevant to the study at hand is reviewed in this chapter. Much of the literature reviewed is concerned with dropouts instead of nonpersisters. Dropping out connotes leaving school while nonpersisting may include transferring to another school or major program of study. However, characteristics and processes involved for both groups are similar.

This chapter is organized into five areas of focus and a brief summary that is pertinent to this study. The areas are: (1) A Brief Review of Selected Research Concerning Oklahoma State University School of Technical Training Students, (2) A Review of Studies Similar to the One at Hand, (3) A Review of Additional Pertinent Studies or Reports on Dropouts, (4) A Summary of Characteristics of Dropouts and Nonpersisters, (5) A Summary of the Dropout Process.

A Brief Review of Selected Research Concerning Oklahoma State University School of Technical Training Students

The researcher in a previous study of student completion and academic background on selected beginning students in the Oklahoma State University School of Technical Training found that math and reading skills were directly related to the students' potential for

graduation. All beginning students enrolled in Accounting, Air Conditioning and Refrigeration, Drafting, Business Data Processing, and Electrical-Electronic Technology who were required to enroll in either Developmental Reading or Developmental Math were tracked in this study to determine if they completed their chosen program of study. He found that, during the period from the spring trimester of 1971 through the fall trimester of 1975, of those students required to take developmental courses only 4 percent of those beginning in Developmental Math and 11 percent of those students beginning in Developmental Reading completed the program of study in which they were enrolled.

Suiter (30), in a study of dropouts by educational classification, showed that students sponsored by the Bureau of Indian Affairs and the Department of Welfare Social and Rehabilitative Services have a significantly higher attrition rate than those students who are not sponsored or those who are sponsored by the Veterans Administration.

Suiter (31), in a report on dropouts at Oklahoma State Tech for the Spring Trimester 1978, indicated that the attrition rate for students enrolled in selected programs of study were as follows: (1) Air Conditioning and Refrigeration--6.85 percent, (2) Accounting--14.6 percent, (3) Business Data Processing--8.69 percent, (4) Electrical-Electronic Technology--9.09 percent, (5) Technical Drafting and Design--7.6 percent. He also found that the above percentages of attrition have been relatively constant in previous trimesters for the same programs of study.

Mayberry (15), in a study of full-time adult student dropouts at Oklahoma State University School of Technical Training, collected,

organized, and summarized data relative to dropouts. His study was directed toward identifying reasons for students dropping out of their program of study. He utilized twelve categorical reasons for students leaving school. They were disciplinary, personal, financial, illness, going to work, excessive absences, lack of progress, dissatisfaction with school, canceling enrollment, military service, going to another school, and leaving school without officially checking out.

In general the studies that have been conducted on the students in the Oklahoma State University School of Technical Training have been concerned with determining levels of departmental attrition and identifying individual factors which are closely associated with the successful completion of program objectives. These factors have then been utilized in the advisement of new and prospective students, consultation of current students, and in attempts to reduce the institution's overall attrition rate. The Oklahoma State University School of Technical Training has been closely monitoring its attrition since 1970 and has experimented with various procedures to assist in decreasing the number of dropouts. These procedures have included departmental counseling, attendance policies, student referral forms, and increased emphasis placed on bringing the problem of attrition into a proper perspective.

Review of Studies Similar to the One at Hand

Heiserman (12), in a review of selected research that had been done on students enrolled in the Oklahoma State University School of Technology, found that the student who drops out of the school has a greater need for nurture and has greater general social needs than the

nondropout. Heiserman's review also indicated that there appeared to be no broad generalizations that could be made about the characteristics of students served by technical education. However, he did find in a study of personal factors and their effects on grade-point average that out of the six factors studied, only marital status correlated with the student's grade-point average.

Heiserman (12) utilized a questionnaire and developed an evaluation model that could identify potential students with a high expectancy of leaving school. The t test was used to identify significant questions and then the questions were programed through a Stepwise Discriminate Analysis Function using a univaried analysis of variance approach. This approach produced coefficients, a constant, and a threshold number that were used as prediction models. The models were used to classify students as persisters or nonpersisters. The most effective model developed by Heiserman had an effectiveness of 77.8 percent on the first administration and was 62.5 percent effective when administered for validation purposes. He felt the most effective time to administer the questionnaire was early in the second week of class during the first semester. Heiserman theorized the questionnaire could be effectively utilized in the identification of potential nonpersistent students.

Anderson (1), in a study of selected characteristics and their relationships to students' success at four post-high school institutions, compared dropouts and persisting technical students, entering freshman and first quarter second year students, freshman persisters and freshman dropouts, and freshman persisters and first quarter second year students. The scores of these groups on thirty-one scales

measuring the variables of interests, values, personality, and socio-economic positions were compared.

In Anderson's comparison of dropouts and persisters, the personality variable was measured on 14 scales of the Omnibus personality inventory. It revealed that dropouts scored significantly different from the persisters on three scales. They were Theoretical Orientation, Impulse Expression, and Personal Integration. The persisters scored higher than the dropouts on Theoretical Orientation and Personal Integration, while dropouts scored higher on the Impulse Expression.

The Kuder Preference record was used to measure the variable of interest. The analysis of variance indicated that there were significant differences among dropouts and persisters on three of the ten scales. The differences were found in the mechanical, scientific, and musical scales.

Anderson (1) observed that dropouts have a more active imagination than persisters, as well as less interest in scientific activities and more feelings of alienation. They had low scores on the mechanical and scientific scales and high scores on the musical scale. Dropouts displayed a slightly more extroverted personality, being more politically minded and more interested in artistic areas rather than scientific. These differences, however, were not great enough to use them as predictors of success or failure in a technical education program.

In addition persisting freshman technical students at the participating institutions and those freshmen who dropped out had similar nonintellectual characteristics, and the total group of dropouts had characteristics similar to persisting students.

Woolsey (36) reported on a study designed to predict student withdrawal from school. He used a hypothetical attrition model in which predicted ability, including I.Q. and aptitude scores, demonstrated ability, including high school grade-point average, and attitudes were measured along with semantic differential judgements of school.

Woolsey found that different aptitude tests, high school grade points, and rank in class were difficult to equate between schools and the attitude of students towards school fluctuates greatly. However, he did find in his study that the I.Q. of dropouts was significantly higher than the I.Q. of the continuing students, and of particular interest was the combination of high I.Q. and relatively low high school achievement of dropouts.

Astin (2), using the California Psychological Inventory in a study of National Merit Scholars, found dropouts to be more aloof, self-centered, impulsive, and assertive than nondropouts. He found that academic promise alone is not a good predictor of academic success in college.

Astin found that entering college students who were most likely to drop out were those who came from low socioeconomic backgrounds. He found that four indicators of socioeconomic level were significantly correlated with dropping out for both sexes. They were mother's education, father's education, father's occupation, and number of friends attending college.

Righthand (24) reports on research to identify technical institute dropouts. He administered a series of standardized tests to 263 freshmen. The Engineering Science Aptitude Test (EPSAT) and the Survey of Study Habits and Attitudes (SSHA) were administered.

One year after the instruments were administered he separated the students into two groups: a survival group for those students remaining in school and an attrition group for those students who had dropped out. Discriminate function analysis was used to determine significant differences in the means score on the tests by the two groups.

Righthand found that the characteristic which differentiates the technical institute dropout from the persisting student is the combination of the math score on the E.P.S.A.T. and the score on the S.S.H.A. He concluded that this substantiated the importance of the role of mathematics in technical education.

Review of Additional Pertinent Studies or Reports on Dropouts

Skaling (27) reported that dropouts were less likely at the time of entrance to college to have had plans of continuing on to professional school. He suggested that educational expectations at the time of entering college may be an important variable to consider when attempting to develop predictors of academic persistence.

Skaling further suggested that researchers should simply ask entering students what their educational expectations are rather than trying to study abstract related motivational variables.

Roesler (25) reports on a study to determine factors contributing to student withdrawal. He sampled 19 percent of the attrition population who were enrolled in 12 or more credit hours. The results from the questionnaire indicated that many reasons were given for withdrawing. Family or personal reasons were cited as the most frequent

reason with going to work and dissatisfaction with the school following in frequency.

Romine (26), in a study of the interaction of learning, personality traits, ability, and environment, stressed the concept that intellectual measures are simply not enough for predicting academic success. He indicated that there has been a lack of intense interest over the last twenty years in identifying particular characteristics which can be reliably used for the purpose of predicting academic success. Romine emphasized that in attempting to predict the success of students, the individual as a whole must be considered.

Astin (3) reports on a study of two year colleges and four year colleges and universities. Data was collected through the Cooperative Institutional Research program of the American Council on Education and involved a four year follow-up of the class of 1970.

He reported the principal findings as follows: (1) The national dropout rate for four year colleges and universities was 40 percent with nearly half of those students that left their original institutions having requested that transcripts be sent to another institution. (2) Dropout rates for two year colleges are higher than those at four year colleges and universities. (3) The principal predictors of persistence are the student's grades in high school and his scores on tests of academic ability. Other predictors include being a man and a nonsmoker; having a high degree of aspirations at the time of college entrance; financing one's college education chiefly through aid from parents, scholarships, or personal savings; and not being employed during the school year. Astin felt that by utilizing these predictors of the students' persistence in a multiple regression equation one may

compute an expected persistence rate for individual colleges. He did not attempt to identify individual nonpersisters at a particular institution.

Astin (4), in a study of prevention of student dropouts, stated that the attrition rate from two year colleges was much higher than the attrition rate from four year colleges and universities. He concluded that students with comparable ability had better chances of returning for a second undergraduate year if attendance was at a four year college. Astin felt these higher attrition rates were due to lower levels of motivation, poor academic preparation, and choice of curricula the second year. It is estimated that fifty percent of the two year college students drop out the first year, and fifty percent of the remaining students drop out the second year.

Terry (32), in a study of dropouts in the College of Vocational Education at Louisiana Tech University, gathered data through personal interviews, letters, and telephone calls. He surveyed 189 dropouts and 79 graduates. In a comparison of the two groups' responses, Terry reported that the study revealed the following significant predictors of academic success: (1) high school grade-point average, (2) college grade-point average, (3) occupation of father, and (4) source of financing.

Terry also reported that ACT scores were not reliable predictors of success in college and that he felt marriage contributed significantly to the rate of attrition.

Pitcher (22), in a study of why college students fail, lists the following: (1) The motivational structure in which the student is functioning is at odds with the motivational structure of higher

education. (2) The student doesn't really want to perform; twenty percent of all students have this problem and are in a constant struggle with passive and aggressive behavior. (3) Approximately twenty-five percent of the students suffer from inadequate development of basic language skills. They have difficulty reading, listening, speaking or writing. (4) The students are unable to survive academically and socially through the manipulation of people. (5) Students tend to have an inadequate concept of what it means to work. The student, prior to coming to college, overestimates the quality of his work and underestimates the difficulty of college course work.

Pitcher also reported that as students begin to encounter problems, they rationalize their shortcomings, and in many instances create conditions which will allow then to drop out.

Summary of Characteristics of Dropouts or Nonpersisters

Nelson (19) found that smaller colleges have lower dropout rates than the large institutions. Cope and Hannah (8), on the other hand, found that there is a tendency for larger institutions to have better retention rates. But, they concluded that a break-even point may exist for each college. The small colleges may have more success in retaining students who graduate from small high schools, while the reverse might prove true with larger colleges.

In the NORCAL study, McMillian (14) proposed the following hypothetical profile of a dropout:

1) The potential dropout is most likely to be Negro, least likely to be Oriental.

2) The potential dropout is likely to be married, divorced, or separated.

3) The potential dropout is likely to be employed part time in a job that is not related to the college major program for which he is enrolled.

4) The potential dropout is likely to come from a family that is less affluent and is likely to express greater concern over matters of finance and employment.

5) The potential dropout is likely to be both physically and/or psychologically distant from his parents' home: he is less likely to turn to his parents for advice, and is less likely to be living under the same roof.

6) The potential dropout is likely to have less perceived parental encouragement for his college plans.

7) The potential dropout is likely to characterize both parents as less loving, kind, or understanding than his persisting counterpart.

8) The potential dropout shows a lower sense of importance of college.

9) The potential dropout is likely to have lower educational aspirations than the persisters.

In phase III of the NORCAL study, Dallas (9) reports that predictors subsequently used were the following:

1) Male
2) Low importance of college to self
3) Advice sought outside
4) Mother working
5) Unidentified obstacles to continuing college
6) Planning for a higher degree
7) Indefinite about attendance plans

8) High anxiety level
9) Low social maturity level

Foster (10), in discussing predictors for persisters in engineering, cited early commitment to engineering, strong vocational goals, parental moral support, strong academic credentials, and perseverance as significant predictors.

The Oklahoma State Regents for Higher Education (21) found that freshmen whose parents were both college graduates persisted through the freshman year at a 13 percent higher rate than did those from families of which neither parent had a baccalaureate degree. In addition the Subcommittee on Retention (29) at Oklahoma State University strongly supports the importance of the family's influence in persisting or dropping out.

Mehra (16) observed that men and women give different reasons for dropping out, and those individuals who are voluntary withdrawals have higher grades than those students who stay on to graduate. She also observed that men drop out mostly due to financial and academic difficulties and women for marriage and loss-of-study motivation.

Cope and Hannah (8) reported that men and women consistently give different reasons for withdrawal; men tend to cite internal and academic reasons while women more frequently mentioned external and non-academic ones.

Astin (5), in a multi-institutional study using several indices of social class, confirmed that children of families of higher social class standing are more likely to persist until graduation.

Hannah (11) found that dropouts discuss their plans and seek advice outside the college, usually with peers and/or parents. Faculty

and other college personnel, when they are consulted, are consulted late in the decision-making process.

Van Dyke and Hoyt (33), in a study of secondary school dropouts, identified many of the same predisposing factors for dropping out as is cited in the NORCAL study. They found that school being too difficult, lack of acceptance, disrespective home situation, financial need, school program inadequate, and engagement or marriage were all indices of nonpersisting.

Stoughton and Grady (28) listed the principal reasons for students withdrawing from high school in both New Mexico and Arizona were non-attendance, lack of interest, and disciplinary difficulties.

Summary of the Dropping Out Process

Cope and Hannah (8) reported for some students the process of withdrawing from college is a painful experience marked by self doubts, disappointment, and depression. For other students the process is a positive step taken with confidence and conviction.

Hannah (11) reported the first thoughts of leaving school actually occur before the initial enrollment for 20 percent of those students who withdraw during their first or second year of college. He also found that 77 percent of the nonpersisters made the decision to drop out during vacations or periods during which classes were not in session. In his research Hannah asked the following questions:

1) When do first thoughts of withdrawal occur?
2) With whom are significant discussions held?
3) What issues are discussed?
4) What attitudes about self and the college are held as the discussions are made?

Hannah found that attitudes toward self and the college were not strong or clear-cut. Only 10 percent claimed strong feelings of disillusionment with college. About one-third of the students felt relieved or happy about leaving, while 40 percent felt strong anxiety about leaving. He found that initial discussion concerning withdrawal was with friends and parents, and when faculty or other college personnel were consulted, it was late in the decision-making process.

Noel (20) found that the proper academic and social/psychological environment are essential to create a staying atmosphere. He stated that some of the following are real reasons students leave school:

1) Isolation (loneliness, depression)
2) Dissonance, incompatability (environment, curriculum, people on the campus)
3) Academic boredom (overlap of high school and uninspired teaching)
4) Irrelevance ("We want to know why we are in school and you don't seem to be able to tell us.")

Noel reported that an essential academic environment must progress toward an educational goal, provide academic success, have clear program options, and provide academic advice. The social/psychological environment must provide a feeling of belonging, personal worth, positive identity, and high self-esteem. He found in his study that the decision to persist in school is made within the first six weeks of class. Therefore, it was concluded first that for a student to stay in school, the student must have at least one instructor who cares; and second he has to be part of a meaningful group.

Barger and Hall (6) suggested that the stress under which students operate at the end of a semester is conducive to thoughts of withdrawal; thus the actual decision to leave is made while students are away from campus when pressures to remain may be low, when

feelings of relief are high, and when other practical and noncollegiate influences are often more strongly felt. Of the nonpersisting students surveyed these were the 10 most frequently mentioned reasons for leaving in rank order:

1) Academic underachievement or difficulty
2) Educational plans and purposes
3) Vocational plans
4) Religious beliefs
5) Attitudes and values
6) Financial problems
7) Plans concerning life in general
8) College rules and regulations
9) Limited offering in college programs
10) Educational opportunities elsewhere

Most of the researchers agreed that dropping out is a process that begins before or early in the student's college life and reaches a culmination decision-making point prior to the eighth week of school. It was also felt by several researchers that the answer to increasing retention rates may lie with increased faculty sensitivity and accessibility.

Summary

The literature suggests that identification of potential nonpersisters must begin early during the first weeks of the beginning semester, and the identification activities should be concluded as soon as possible prior to the eighth week of school.

Literature also reflects that the attrition problem is a multifaceted problem with various characteristics and factors involved. Therefore, it is more equitable in categorizing persisting and nonpersisting students to utilize groups of characteristics and factors rather than trying to detect a single reason for attrition.

The questionnaire has been used in numerous studies as a data-gathering instrument. Due to the flexibility and the adaptability of a questionnaire, it seems as though the utilization of such an instrument would be the most equitable approach to use in determining a student's perceived role in an educational setting.

The Freshman Questionnaire developed by Heiserman (12) reflects factors identified in the literature as being significant in identifying potential nonpersisters. It utilizes a multifaceted approach with both personal and academic factors considered. Therefore, if the instrument were adapted for the institution, it seems probable that it could be used effectively to aid in the early identification of students with a high expectancy for withdrawing.

CHAPTER III

METHODOLOGY

The objective of this study was to test a method of early identification of beginning students with a high probability for leaving the Oklahoma State University School of Technical Training during their first year. The initial problems were to identify the students to be studied and adapt an instrument utilized by Heiserman (12) in a similar study of technical students at the Oklahoma State University School of Technology. Next, an instrument-administration technique had to be established to insure a high return rate. The responses had to be statistically analyzed to determine if the Heiserman models or a new model developed from the adapted questionnaire could be used to identify students with a high expectancy for leaving school. These activities are discussed in this chapter.

Definition of Terms

The following definitions were developed to help clarify how these terms are used in this report. They admittedly may differ from the more structured definitions of these terms when used in a more generic sense.

Academic Year - A period of time consisting of a fall and a spring trimester.

Adapted Model A - A model using the questions Heiserman found to be significant in his Model A and new coefficients calculated from the data collected.

Adapted Model B - A model using the questions Heiserman found to be significant in his Model B and new coefficients calculated from the data collected.

Beginning Students - Those new students enrolling for the first time in Accounting, Air Conditioning and Refrigeration, Business Data Processing, Electrical-Electronic Technology, and Technical Drafting and Design programs of study at the Oklahoma State University School of Technical Training in Okmulgee, Oklahoma.

Dropouts - Students who leave school to engage in an activity other than organized education.

Effective - The term producing the effect of correctly categorizing students as persisters or nonpersisters with greater than fifty percent accuracy.

Heiserman Model A - A model developed by Heiserman using the eight items on the instrument he felt were significant in classifying nonpersisters.

Heiserman Model B - A model developed by Heiserman using the three items on the instrument he felt were significant in classifying nonpersisters.

Instrument - The questionnaire utilized for the purposes of this study.

Items - The individual questions that make up the instrument used in this study.

New Model - A model derived by using selected questions. These items were indicated as significant when the response data were processed through a Stepwise Discriminate Analysis computer program.

Nonpersisters - Those beginning students who leave the Oklahoma State University School of Technical Training during their first two trimesters of school. They may be dropouts or transfers to another school or program of study.

Persisters - A beginning student who remains in his initial program of study at the School of Technical Training for the first two trimesters.

Response - The beginning student's answer to an individual item on the instrument.

Total Model - A model derived by comparing all responses to all items on the instrument and analyzing the data through a Stepwise Discriminate Analysis computer program.

Trimester - An academic term of fifteen weeks duration.

Validation Nonpersister - Those students who started the spring trimester and withdrew from their program of study prior to the completion of the trimester.

Validation Persister - Those beginning students who started the spring trimester and completed it.

Assumptions

The following assumptions were made for the purposes of this study. These assumptions are necessary to aid in the development of limitations that this study may have.

1. The students studied in this research were representative of all beginning students in the Oklahoma State University School of Technical Training.
2. The first few weeks of the first trimester of school are the most critical for purposes of identifying potential nonpersistent beginning students.
3. Students will respond honestly to each item making up the instrument.

Hypothesis

The following hypotheses were tested on the questionnaire to determine if the total questionnaire or specific items on the questionnaire were effective in identifying students who were nonpersisters.

1. The Heiserman Models are not effective in the identification of persisters and nonpersisters at the Oklahoma State University School of Technical Training.
2. The models developed from the data gathered on the instrument are not effective in the identification of persisters and nonpersisters at the Oklahoma State University School of Technical Training.
3. The New Student Confidential Questionnaire is not effective in the gathering of data for the identification of persisters and nonpersisters at the Oklahoma State University School of Technical Training.

Selection of the Subjects

The subjects selected for this study were students enrolled in the Oklahoma State University School of Technical Training during the fall trimester of 1977 and the spring trimester of 1978. They were enrolled for the first time in the beginning courses of the Accounting, Air Conditioning and Refrigeration, Business Data Processing, Electrical-Electronic Technology, and Technical Drafting and Design programs of study. These students were selected because they were enrolled in programs of study with a higher degree of mathematical and theoretical orientation in the curricula. The researcher felt that these students would closely parallel those students in the Heiserman study (12).

Adaptation of the Instrument

The questionnaire used in this study was developed by Heiserman (12) to seek student responses in the following areas: (1) family encouragement, (2) importance of college to self, (3) concern about finances, (4) sources of advice, (5) anxiety, (6) self concept, (7) educational expectations, (8) high school performance, and (9) perception of the institute being attended. Table I on the next page is a summary of which questions are associated with which areas of inquiry and these items can be reviewed in the Appendix.

The instrument was carefully designed with detailed instructions, sample familiarization questions, questions asked in both a positive and negative form; and the questionnaire was lengthy to counter remembering responses. The responses on the questionnaire were

recorded on a Likert-type response scale and a Semantic Differential Scale was used to develop a self-image profile.

TABLE I

QUESTIONS ASSOCIATED WITH PARTICULAR AREAS OF INQUIRY

Area of Inquiry	Questions
1. Family Encouragement	3, 13, 21, 23, 25, 30, 40, 46, 51
2. Importance of College to Self	4, 10, 14, 22, 24, 33, 35
3. Concern About Finances	5, 16, 26, 37, 38, 49
4. Sources of Advice	6, 17, 27, 34, 39, 48
5. Anxiety	8, 18, 31, 42
6. Self Concept	12, 29, 45, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65
7. Educational Expectations	9, 11, 15, 19, 20, 32, 44
8. High School Performance	1, 43
9. Perception of Institute Being Attended	2, 7, 28, 36, 41, 47, 50

The student identification required the listing of the student's name, social security number, date of birth, major and sex. The students were also asked to sign a statement to allow the researcher access to their records.

All students were informed that the information requested was confidential and that no one other than the researcher would review the questionnaires.

The Heiserman (12) Freshman questionnaire was revised in August, 1977, and was reviewed by fellow staff members. They offered suggestions as to the rewording of selected items and as to word choice involved in the revision of the original semantics. The final revision of the instrument resulted in the New Student Confidential Questionnaire which is displayed in the Appendix. Table II below is a summary of the revision of the wording used on the instrument.

TABLE II

A COMPARISON OF SEMANTIC REVISIONS
MADE FOR THIS STUDY

Freshman Questionnaire	New Student Questionnaire
1. Freshman Confidential Questionnaire	New Student Confidential Questionnaire
2. O. S. U.	O. S. T.
3. Freshman	New Student
4. Technologist	Technician
5. Graduate school	Pursue a degree
6. Major subject I am taking	Department I am enrolled in
7. College education	Technical education
8. Technology	Technical
9. School of Technology	Oklahoma State Tech

Collection of Data

The instrument was administered during the seventh class meeting on Tuesday of the second week of the fall trimester, 1977. The second week of classes was selected in that it was the first week following the end of the late enrollment period; too, the instrument was administered during the second week of classes in the Heiserman study (12).

All new students enrolled in their first trimester in the Accounting, Air Conditioning and Refrigeration, Business Data Processing, Electrical-Electronic Technology, and Technical Drafting and Design programs of study were asked on a voluntary basis to complete the instrument. The instruments were distributed to the students by their respective Department Heads. The purposes of the instrument were explained, and the students were asked to complete the instrument in class and return it to their instructors at the end of the class period.

The second time the instrument was administered to the new beginning students was the seventh class meeting on Tuesday of the second week of the spring trimester, 1978. The same delivery technique for the administration of the instrument was used.

The number of new students enrolled in the programs of study was again used as the potential number of instruments to be returned. The number of students officially enrolled was 107, and there were 86 instruments returned. This represented a return rate of 80 percent.

Analysis of Data

In January and May of 1978, the records of those students who completed the New Student Confidential Questionnaire during the fall

of 1977 were reviewed. The purpose of the review was to correctly classify the participating students as persisters and nonpersisters.

The records of the students who completed the questionnaire during the spring trimester of 1978 were reviewed in May of 1978 to determine their actual classification as persisters or nonpersisters.

As a result of reviewing the study with Professor Morrison (18) and Research Assistant Coburn (7) of the Oklahoma State University Statistics Department as to the best approach for statistical analysis of the data and the validation of the Heiserman study (12), several recommendations emerged. These were the recommendations:

1. Test the ability of the Heiserman Model A and B to correctly classify persistent and nonpersistent students on the Oklahoma State University School of Technical Training campus. This would be accomplished by applying the Heiserman models to the significant responses on the instrument and comparing its student placement to the student's actual classification.
2. Calculate new coefficients for the Heiserman Model formulas from the data gathered in the completion of the instrument. Insert the new coefficients in the Heiserman formula and determine if the new coefficients increase the predictive accuracy.
3. Use the larger sample obtained in the 1977 administration for testing the hypotheses and developing a new model for identifying nonpersisters.
4. Use the smaller sample obtained in the spring of 1978 to validate the new model.

5. Develop a Total Model using all items on the instrument.

The Stepwise Discriminate Analysis Program is a standard program available at the Oklahoma State University Computer Center as a part of the Statistical Package for the Social Sciences. Morrison (18) recommended that all data be placed on computer cards and analyzed. The Stepwise Discriminate Analysis Program was used in this analysis.

The student responses were numerically coded and the data was punched on computer cards. The computer was then programed to analyze the student responses and categorize each as a persister or nonpersister using the significant questions and formulas for Heiserman's Model A and B. The model classification was then compared to the actual classification of the student.

The computer was then reprogramed and all items on the instrument were analyzed using the Stepwise Discriminate Analysis Program to determine if any combination of questions could be used to significantly differentiate between persisting and nonpersisting students.

An Adapted Model, New Model, and a Total Model were then developed and applied to the data on the instruments to determine the accuracy of the model in predicting persisting and nonpersisting students. This procedure was carried out on the instruments completed in the fall of 1977, and the same procedure was used for validation purposes on the New and Total Models using data from the instrument completed in the spring of 1978.

Limitations

This instrument was adapted for this study to deal with beginning students in the Oklahoma State University School of Technical Training only. If this technique were to be utilized with other groups, the instrument would need to be modified, terminology changed, a new model developed, and verification of the new model's effectiveness should be completed prior to instituting the use of this technique or instrument.

CHAPTER IV

RESULTS

The results of the study are presented in this chapter. The chapter is divided into five sections: (1) Background, which covers the return rates of the questionnaire; (2) Validation of the Heiserman Model A and B, which covers the application of the models to the data gathered by the New Student Confidential Questionnaire; (3) Analysis and Model Development, which uses the Stepwise Discriminate Analysis to develop models for identifying students with a high expectancy for nonpersisting; (4) Model Selection, which is a comparison of the models developed and their ability to identify potential nonpersisting students; (5) Validation, which covers the applications of the Total Model and New Model to a separate group of students and compares model prediction to the actual classification.

Background

The instrument was administered to all beginning students enrolled in the Accounting, Air Conditioning and Refrigeration, Business Data Processing, Electrical-Electronic Technology, and Technical Drafting and Design programs of study at Oklahoma State University School of Technical Training. The instrument was administered during the seventh class meeting on Tuesday of the second week of classes in the fall trimester of 1977.

The potential number of instruments to be returned was 286. This represented the number of new students shown officially enrolled in the programs of study included in the survey.

The procedure utilized for the completion of the instrument led to a return of 240 instruments. This represented an overall return rate of 84 percent. Table III contains the return rates of the questionnaires by program of study.

The official new student enrollment in the programs of study surveyed was 286 students.

TABLE III

RETURN RATE OF THE INSTRUMENT BY PROGRAM OF STUDY FOR THE FALL OF 1977

Program of Study	Beginning Student Enrollment	Number of Returns	Percentage of Return
Accounting	49	28	57.1
Air Conditioning and Refrigeration	76	73	96.1
Business Data Processing	35	25	71.4
Electrical-Electronic Technology	85	80	94.1
Technical Drafting and Design	41	34	82.9
TOTAL	286	240	83.9

The instrument was again administered to all beginning students enrolled in the Accounting, Air Conditioning and Refrigeration, Business Data Processing, Electrical-Electronic Technology, and Technical Drafting and Design programs of study at Oklahoma State University School of Technical Training. The questionnaire was administered during the seventh class meeting on Tuesday of the second week of class in the spring trimester of 1978. Table IV contains the return rates of the questionnaire by program of study.

There were 107 new students enrolled in the program of study included in the study in the spring of 1978.

TABLE IV

RETURN RATE OF THE INSTRUMENT BY PROGRAM OF STUDY FOR THE SPRING OF 1978

Program of Study	Beginning Student Enrollment	Number of Returns	Percentage of Return
Accounting	16	13	81.3
Air Conditioning and Refrigeration	31	26	83.9
Business Data Processing	8	6	75.0
Electrical-Electronic Technology	29	19	65.5
Technical Drafting and Design	23	22	95.7
TOTAL	107	86	80.4

It was decided that both samples obtained would be used to test the efficiency of the Heiserman models abilities to correctly classify students with a high expectancy of leaving school. The Adapted Model was also applied to both samples.

Then the larger sample obtained in 1977 would be analyzed for model development of a Total Model and a New Model. After the models were developed, they were then used in a validation study. This study used the data gathered from the completion of the questionnaire in the 1978 sample. The predicted placement of the students into groups of persisters and nonpersisters was then compared to the actual classification of the student.

Validation of the Heiserman Model A and B

The two models developed by the Heiserman (12) utilized selected questions which he felt were most sensitive to differences between persisters and nonpersisters. The models developed were applied to the data to categorize students as persisters or nonpersisters. Heiserman found his Model A and B to have the highest degree of accuracy in predicting nonpersistent students. Those questions Heiserman felt to be significant in the construction of Model A and Model B are listed in Table V.

Each model produced was of the form:

$$Y = K1(R1) + K2(R2) = ...KN(RN) + C,$$

where the K's are called coefficients for canonical variables; the R's are the students' coded responses to corresponding questions. They were coded as follows:

1 = Strongly Agree

2 = Agree

3 = Can't Say

4 = Disagree

5 = Strongly Disagree

0 = Don't Understand

TABLE V

A SUMMARY OF THE HEISERMAN
SIGNIFICANT QUESTIONS

Model A Questions	Model B Questions
(3) My family is happy about my going on to school.	(8) I worry about my poor study habits.
(8) I worry about my poor study habits.	(12) I ask a lot of questions in class.
(13) My family is helping me go to school.	(39) Friends and other students are my main source of advice about school.
(24) A college education is important to me because of its economic value.	
(31) I worry about my future.	
(44) A college education is not really important anymore.	
(46) I can count on my family if a money problem comes up.	
(50) The campus is big, but everyone has been helpful.	

The C in the model is a constant, and the Y is the number computed and then compared to a threshold number. If Y is greater than the threshold number, then the student is classified as a nonpersister. If Y is equal to or less than the threshold number, then the student is classified as a persister.

Heiserman's Model A was as follows:

$$Y + (-0.72016)(R3) + (-0.422400)(R8) + (-0.06214)(R13) + (-0.12796)(R24) + (-0.34638)(R31) + (0.40854)(R44) + (-0.19534)(R46) + (-0.18469)(R50) + 2.62261.$$

The R's are the coded student responses to questions 3, 8, 13, 24, 31, 44, 46, and 50. The computed threshold number for Model A was 0.36685.

Model A was applied to the data gathered on the New Student Confidential Questionnaire during the fall of 1977 and the spring of 1978. Table VI is a summary of how well Model A performed when comparing the model's predictions to the actual classification of the students.

It can be seen that the model classified 116 students as nonpersisters and was in error 87 times when compared to the student's actual classification. However, the sample that Model A classified as nonpersisters actually contained 29 out of the 78 students identified as actual nonperisters.

Heiserman's Model B was:

$$Y = (-0.36574)(R8) + (0.67430)(R12) + (0.54166)(R39) + 2.48882.$$

Again, the R's are coded student responses to questions 8, 12, and 39. The computed threshold number for Model B was 0.24455.

TABLE VI

CLASSIFICATION MATRIX USING MODEL A

Actual	Number of Cases Classified as: Nonpersisters	Persisters
Nonpersisters	29	49
Persisters	87	161
TOTAL	116	210

Samples classified correctly contained 29 actual nonpersisters and 161 actual persisters for an effectiveness of $\frac{190}{326} \times 100 = 58.28$ percent.

Model B was applied to the data gathered on the New Student Confidential Questionnaire during the fall of 1977 and the spring of 1978. Table VII is a summary of how well Model B performed when comparing the model's predictions to the actual classification of the students.

It can be seen that the model classified 138 students as nonpersisters and was in error 108 times when compared to the student's actual classification. The sample that Model B classified as nonpersisters contained 30 out of 78 students identified as actual nonpersisters.

Hypothesis 1, The Heiserman Models are not effective in the identification of persisters and nonpersisters at the Oklahoma State University School of Technical Training. In the application of the Heiserman Model A, 37.18 percent of the nonpersisters were classified correctly; and in the application of the Heiserman Model B, 38.46

percent of the nonpersisters were correctly classified. Since neither model correctly classified more than fifty percent of the nonpersisters, Hypothesis 1 was not rejected.

TABLE VII

CLASSIFICATION MATRIX USING MODEL B

Actual	Number of Students Classified as: Nonpersisters	Persisters
Nonpersisters	30	48
Persisters	108	140
TOTAL	138	188

Samples classified correctly contained 30 actual nonpersisters and 140 actual persisters for an effectiveness of $\frac{170}{326} \times 100 = 52.14$

Analysis and Model Development

The data from the 326 questionnaires completed during the fall of 1977 and the spring of 1978 were coded with each of the student's actual classification. Then the questions found to be significant in the classification of potential nonpersisters in Model A and a Statistical Package for the Social Sciences Direct Discriminate Analysis program were used to compute a new discriminate function. The new function utilized the same questions Heiserman (12) felt to be significant in

Model A but used new coefficients computed from the data gathered in the administration of the instrument. This procedure produced the Adapted Model A:

$$Y = (-0.33613)(R3) + (-0.15983)(R8) + (-0.10654)(R13) + (0.91840)(R24) + (0.12848)(R31) + (0.02461)(R44) + (-0.41406)(R46) + (-0.35831)(R50) + 1.18738.$$

This model was applied to the responses gathered from the questionnaires completed during the fall of 1977 and the spring of 1978. Table VIII is a summary of how well the Adapted Model A performed when comparing the model's predictions to the actual classification of the students.

The same statistical analysis process was used to produce Adapted Model B:

$$Y = (-0.35205)(R8) + (-0.95294)(R12) + (-0.11487)(R39) + 4.31649.$$

Again, this model was applied to the responses gathered from the questionnaire completed during the fall of 1977 and the spring of 1978. Table IX is a summary of how well the Adapted Model B performed when comparing the Model's predictions to the actual classification of the students.

The computation of new coefficients for the adapted models resulted in an increased percentage of correct classification of nonpersisters. Model A classified 37.18 percent of the nonpersisters correctly while Adapted Model A classified 60.26 percent of the nonpersisters correctly. Model B, likewise, increased its predictive level of nonpersisters when new coefficients were calculated. Model B classified 38.46 percent

of the nonpersisters correctly while Adapted Model B classified 57.69 percent of the nonpersisters correctly.

TABLE VIII

CLASSIFICATION MATRIX USING ADAPTED MODEL A

Actual	Number of Cases Classified as: Nonpersisters	Persisters
Nonpersisters	47	31
Persisters	110	138
TOTAL	157	169

Samples classified correctly contained 47 actual nonpersisters and 138 actual persisters for an effectiveness of $\frac{185}{326} \times 100 = 56.75$ percent.

TABLE IX

CLASSIFICATION MATRIX USING ADAPTED MODEL B

Actual	Number of Cases Classified as: Nonpersisters	Persisters
Nonpersisters	45	33
Persisters	110	138
TOTAL	155	171

Samples classified as correctly contained 45 actual nonpersisters and 138 actual persisters for an effectiveness of $\frac{183}{326} \times 100 = 56.13$ percent.

The Statistical Package for the Social Sciences Direct Discriminate Analysis program was then applied to the data gathered from the completion of the questionnaire in the fall of 1977. The Stepwise Discriminate Analysis program was programed on 50/50 proportional priors and applied to the data in a multivariance approach to determine correlation among items. This resulted in a formula model utilizing all 65 items on the questionnaire.

The Total Model is as follows:

$$
\begin{aligned}
Y = {} & (0.20268)(R1) + (-0.04985)(R2) + (-0.37880)(R3) \\
& + (-0.12022)(R4) + (-0.25038)(R5) + (0.02907)(R6) \\
& + (-0.14470)(R7) + (-0.12022)(R8) + (0.05559)(R9) \\
& + (-0.38808)(R10) + (-0.05895)(R11) + (-0.22021)(R12) \\
& + (0.09381)(R13) + (0.04634)(R14) + (0.26040)(R15) \\
& + (0.16575)(R16) + (-0.10261)(R17) + (0.10168)(R18) \\
& + (0.16435)(R19) + (-0.17044)(R20) + (0.42240)(R21) \\
& + (-0.15351)(R22) + (0.08750)(R23) + (-0.08087)(R24) \\
& + (-0.28876)(R25) + (0.20985)(R26) + (0.24367)(R27) \\
& + (-0.07794)(R28) + (0.04440)(R29) + (-0.00925)(R30) \\
& + (0.30797)(R31) + (0.20089)(R32) + (-0.05940)(R33) \\
& + (0.09558)(R34) + (0.17047)(R35) + (-0.09628)(R36) \\
& + (-0.15715)(R37) + (-0.20615)(R38) + (0.12894)(R39) \\
& + (-0.04153)(R40) + (-0.14982)(R41) + (0.01539)(R42) \\
& + (-0.14209)(R43) + (0.08109)(R44) + (0.35382)(R45) \\
& + (-0.12351)(R46) + (0.03321)(R47) + (-0.06677)(R48) \\
& + (-0.22048)(R49) + (-0.11116)(R50) + (-0.23661)(R51) \\
& + (-0.14127)(R52) + (0.02153)(R53) + (-0.12628)(R54) \\
& + (-0.19416)(R55) + (-0.16989)(R56) + (0.21570)(R57)
\end{aligned}
$$

$$+ (-0.09580)(R58) + (0.16619)(R59) + (0.08422)(R60)$$

$$+ (-0.07818)(R61) + (-0.03489)(R62) + (-0.00870)(R63)$$

$$+ (-0.17477)(R64) + (0.09499)(R65) + 4.06141.$$

The Total Model was then applied to the data gathered in the fall of 1977. Table X is a summary of how well the Total Model performed when comparing the model's predictions with the actual classification of the students.

TABLE X

CLASSIFICATION MATRIX USING THE TOTAL MODEL

Actual	Number of Cases Classified as: Nonpersisters	Persisters
Nonpersisters	52	15
Persisters	47	126
TOTAL	99	141

Samples classified correctly contained 52 actual nonpersisters and 126 actual persisters for an effectiveness of $\frac{178}{240} \times 100 = 74.17$ percent.

The Total Model classified 52 out of 67 nonpersisters correctly. This represented a 77.61 percent correct placement of nonpersisters.

The Stepwise Discriminate Analysis program was also programed to select those items which were most significant in discriminating between persisting and nonpersisting students. The results indicated

that there were eighteen items that were significant in differentiating between the persisters and nonpersisters.

These items were as follows:

1) My high school grades were good.

2) O.S.T. seems bigger than my hometown.

4) A college education is important for men.

5) I worry a lot about money for my education.

7) It is easy to get to know other students on campus.

10) I don't really know why I came to school.

11) I plan to pursue a degree program some day.

15) I want to be a Technician.

16) O.S.T. helped me get money for my education.

21) My family is happy about the Department I am enrolled in.

25) Getting an education will please my family.

26) I have money problems, but no one seems interested in helping.

31) I worry about my future.

35) It is well worth the effort to graduate.

38) Going to school takes good budgeting and money management.

41) The campus is big, everything seems to be a hassle.

49) Money for my education is available.

64) Talkative 0 0 0 0 0 Quiet

The responses to these questions and their coefficients were then used to construct a New Model. Table XI is a summary of how well the New Model performed when comparing the model's predictions with the actual classification of the students.

The New Model classified 47 out of 67 nonpersisters correctly. This represented a 70.15 percent correct placement of nonpersisters.

The New Model is as follows:

$$Y = (0.26043)(R1) + (-0.08257)(R2) + (-0.12251)(R4) + (-0.35109)(R5) + (-0.19184)(R7) + (-0.40661)(R10) + (-0.06097)(R11) + (0.28353)(R15) + (0.15698)(R16) + (0.34674)(R21) + (-0.35234)(R25) + (0.33477)(R26) + (0.30867)(R31) + (0.39428)(R35) + (-0.32674)(R38) + (-0.38017)(R41) + (-0.27647)(R49) + (-0.20493)(R64) + 3.09752.$$

TABLE XI

CLASSIFICATION MATRIX USING THE NEW MODEL

Actual	Number of Cases Classified as: Nonpersisters	Persisters
Nonpersisters	47	20
Persisters	57	116
TOTAL	104	136

Samples classified correctly contained 47 actual nonpersisters and 116 actual persisters for an effectiveness of $\frac{163}{240} \times 100 = 67.92$ percent.

Hypothesis 2, The prediction models developed from the data gathered in the study vary in their ability to classify students correctly. The least effective was the Adapted Model B which

correctly classified 56.13 percent of the nonpersisters and 74.47 percent of the persisters. The most effective model was the Total Model. It correctly classified 74.14 percent of the nonpersisters and 89.36 percent of the persisters correctly.

Therefore, Hypothesis 2 was rejected in that the models developed from the data gathered on the instrument are effective in the identification of persisters and nonpersisters at the Oklahoma State University School of Technical Training.

Model Selection

The models developed in this study were developed through the use of the Statistical Package for the Social Sciences Direct Discriminate Analysis Program and the data gathered from the completion of the New Student Confidential Questionnaire.

The Adapted Models were applied to the data gathered during the fall trimester of 1977 and the spring trimester of 1978. The responses gathered from the instruments completed during the fall of 1977 were then used for model development. The New Model and the Total Model were developed from the data gathered from the completion of the questionnaire in the fall of 1977.

Table XII is a summary of the prediction level characteristics of the four models developed from the questionnaire data.

As can be seen in Table XII, the samples of nonpersisters correctly categorized by the Adapted Model A and B are of comparable size. However, the samples categorized by the New Model and Total Model correctly classified a more noteworthy percentage of the actual nonpersisters. The researcher, therefore, felt that the New Model or

the Total Model should be used in the early identification of beginning students with a high expectancy for nonpersisting. The Total Model and the New Model were both used for the validation study.

TABLE XII

SUMMARY OF MODEL CHARACTERISTICS

Model	Group Categorized Nonpersisters	Number of Actual Nonpersisters	Total Number of Nonpersisters
Adapted Model A	157	47	78
Adapted Model B	155	45	78
New Model	104	47	67
Total Model	99	52	67

Validation

The Total Model and the New Model were both used in the validation study. The student data that was gathered from the completion of the New Student Confidential Questionnaire in the spring of 1978 were used for the validation study.

The data gathered from the 86 students who completed the questionnaire were coded and programed into the computer. The computer was then programed to classify the students as persisters or nonpersisters. The student classification provided by the computer using Stepwise

Discriminate Analysis was then compared to the actual classification of the student.

The Total Model was used first in the validation study, and Table XIII indicates the performance of the model.

TABLE XIII

CLASSIFICATION MATRIX USING THE TOTAL MODEL AND DATA GATHERED FROM 1978 STUDENTS

Actual	Number of Cases Classified as: Nonpersisters	Persisters
Nonpersisters	11	0
Persisters	0	75
TOTAL	11	75

Samples classified correctly contained 11 actual nonpersisters and 75 actual persisters for an effectiveness of $\frac{86}{86} \times 100 = 100$ percent.

The Total Model classified 100 percent of the persisters and nonpersisters correctly on the validation data. The researcher feels that in this instance an individual should be extremely cautious in making assumptions. The smaller the number of observations and the larger the number of variables a researcher uses, the greater the chances are of describing each individual adequately. The researcher,

therefore, feels that the correct discrimination of 100 percent of the nonpersisters was a statistical accident.

The New Model was also applied to the student data gathered during the spring of 1978, and Table XIV indicates the performance of the model.

TABLE XIV

CLASSIFICATION MATRIX USING THE NEW MODEL AND DATA GATHERED FROM 1978 STUDENTS

Actual	Number of Cases Classified as: Nonpersisters	Persisters
Nonpersisters	9	2
Persisters	15	60
TOTAL	24	62

Samples classified correctly contained 9 actual nonpersisters and 60 actual persisters for an effectiveness of $\frac{69}{86} \times 100 = 80.23$ percent.

The sample of the nonpersisters classified by the computer using the Total Model contained all 11 of the actual nonpersisters for 100 percent effectiveness. The sample of the nonpersisters classified by the computer using the New Model contained 9 of the 11 actual nonpersisters. This represented an effectiveness of 81.82 percent.

Hypothesis 3, The New Student Confidential Questionnaire is not effective in the gathering of the data for the identification of persisters and nonpersisters at the Oklahoma State University School of Technical Training.

The responses to the instrument items provided data which was used in model development. The four models developed were all effective in the identification of persisters and nonpersisters. Therefore, Hypothesis 3 was rejected in that the New Student Confidential Questionnaire is effective in the gathering of data to be used in the identification of persisters and nonpersisters.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This study emerged over a national concern of decreasing enrollments in colleges throughout the nation in general and in specific the decreases in enrollment projected for colleges in Oklahoma. Specifically the study deals with the problem of attrition and the categorization and identification of potential nonpersisters on the Oklahoma State University School of Technical Training campus in Okmulgee, Oklahoma. This study was focused on an instrument and prediction models which could be used to effectively identify students with a high potential for leaving school early in their program of study.

Summary

The purpose of this study was to test a method of early identification of beginning students with a high expectancy for leaving Oklahoma State University School of Technical Training during their first year.

The objective of the study was to adapt a questionnaire and validate a model used by Heiserman (12). Other models were then developed that could more effectively identify students with a high expectancy for withdrawing before the completion of their first year.

The New Student Confidential Questionnaire was adapted and administered to students enrolled as beginning students in Accounting, Air

Conditioning and Refrigeration, Business Data Processing, Electrical-Electronic Technology, and Technical Drafting and Design. The instrument was administered on Tuesday of the second week of class in the fall trimester of 1977 and the spring trimester of 1978.

The Heiserman Models A and B were then applied to the data using only the responses to questions which he found to be significant in discriminating between persisters and nonpersisters. Model A classified 37.18 percent of the nonpersisters correctly while Model B classified 38.46 percent of the nonpersisters correctly.

The Adapted Models A and B were then developed using the items Heiserman had found to be significant in differentiating between persisters and nonpersisters. New coefficients were calculated from the data gathered by using the Statistical Package for the Social Sciences, Stepwise Discriminate Analysis Program on the computer and the raw data from the significant items. Adapted Model A classified 60.26 percent of the nonpersisters correctly while Adapted Model B classified 57.69 percent of the nonpersisters correctly.

The data from the questionnaire completed in the fall of 1978 were then programed into the computer, and by means of Stepwise Discriminate Analysis, two more models were developed. They were the Total Model and the New Model. When the Total Model was applied to the fall 1977 data, it classified 52 out of 67 nonpersisters correctly for an effectiveness of 70.15 percent.

Both models were then used in a validation study. They were applied to the data gathered in the spring of 1978. The Total Model classified 100 percent of the nonpersisters correctly while the New Model classified 81.82 percent of the nonpersisters correctly.

Conclusions

1. The New Student Confidential Questionnaire can be used effectively to gather information relative to the identification of potential nonpersisters at the Oklahoma State University School of Technical Training.
2. Information collected from responses on the New Student Confidential Questionnaire can be used in model development to discriminate between persisting and nonpersisting students.
3. Selected items on the questionnaire are more significant in discriminating between persisters and nonpersisters than are other items. This is evident in the increased effectiveness of the New Model using only those items the author found to be most significant in differentiating between persisters and nonpersisters.
4. The models developed using data from the instrument and the Statistical Package for the Social Sciences Discriminate Analysis Program were able to identify groups of students containing from 57.69 percent to 100 percent of the actual nonpersisters.
5. The four models developed had varying degrees of effectiveness in terms of categorizing groups of students correctly as persisters or nonpersisters.
6. Administering the instrument early in the first trimester is very important. This finding is in keeping with results reported in the literature. This is substantiated in research done by Barger and Hall (6), Hannah (11), and Noel (20).

7. The most effective model developed was the Total Model. In the application of the Total Model to the data gathered in the completion of the New Student Confidential Questionnaire during the fall trimester of 1977 and the spring trimester of 1978 and comparing the model's prediction of nonpersisters to the student's actual classification, 63 out of 78 nonpersisters were categorized correctly for an overall effectivess of 80.77 percent.

Recommendations

The following recommendations are predicated on the findings of this study and on the author's experiences during this study:

1. This method for early identification of nonpersisters should be continued over the next year to determine if the prediction effectiveness of the models remains relatively constant.
2. The models developed in this study should be used in the categorization of potential nonpersisters for the purpose of more effectively assigning advisors to work with those students who may require the most attention to remain in school.
3. The Counselors, Advisors, and Department Heads should initiate various procedures to work with students who are identified as potential nonpersisters. These procedures should then be reviewed to determine their effectiveness in decreasing the institution's attrition rate.
4. The same approach to early identification of nonpersisters should be applied to new students in the other programs of study on the Oklahoma State University School of Technical

Training campus. This approach could indicate if a campus-wide application of the technique is advisable.

5. The New Student Confidential Questionnaire should be administered to similar student groups at other institutions. The prediction models should be applied and new model formulas developed utilizing formula coefficients calculated from the data gathered at the respective institution.
6. A study should be conducted to determine if significant areas of concern to nonpersisters on the questionnaire correspond with the reasons given by students for withdrawing from school during the withdrawal process.
7. It is recommended that all data collected be examined carefully and that positive effects that may result in treatment of groups of potential nonpersisters be weighed against the negative effects that could result in the same treatment. This should be done prior to any application of the treatment methods.

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APPENDIX

NEW STUDENT CONFIDENTIAL QUESTIONNAIRE

INSTRUCTIONS

This questionnaire is treated as confidential.

Your responses will be used for computing statistical trends of new students. **Your individual responses will be kept secret.**

Please read the following instructions, then respond to the questionnaire **honestly and candidly. Thank you.**

(1) Read each statement carefully.

(2) Check the square closest to your first reaction to the statement. (check only one) ☑

(3) Keep in mind there are no "right" or "wrong" answers.

(4) If you do not understand a question or statement, check the square by the question number.

Now turn to the next page for two samples.

NEW STUDENT QUESTIONNAIRE

Date _____

Name (Print) _____

Social Security Number _____

Date of Birth _____

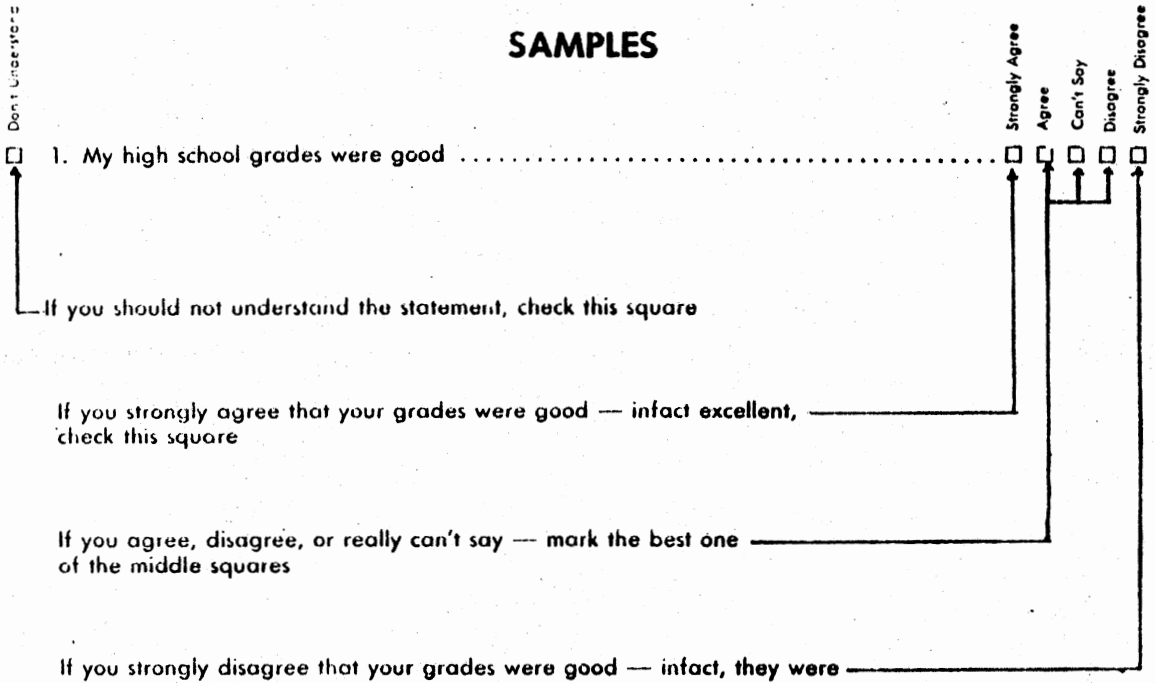
Subject being studied at O.S.T. (Major) _____

Sex: ☐ male ☐ female

The school official performing this research, has my permission to examine my school records with regard to my academic progress.

_____
Signature

SAMPLES



Now try the next one — if you have a question, ask!

☐ 2. O.S.T. seems larger than my hometown ..... ☐ ☐ ☐ ☐ ☐

ALL SET — Continue

Don't Understand		Strongly Agree	Agree	Can't Say	Disagree	Strongly Disagree
☐	3. My family is happy about my going on to school	☐	☐	☐	☐	☐
☐	4. A college education is important for men	☐	☐	☐	☐	☐
☐	5. I worry a lot about money for my education	☐	☐	☐	☐	☐
☐	6. Teachers are my main source of advice about school	☐	☐	☐	☐	☐
☐	7. It is easy to get to know other students on campus	☐	☐	☐	☐	☐
☐	8. I worry about my poor study habits	☐	☐	☐	☐	☐
☐	9. I plan to make good grades	☐	☐	☐	☐	☐
☐	10. I don't really know why I came to school	☐	☐	☐	☐	☐
☐	11. I plan to pursue a degree program someday	☐	☐	☐	☐	☐
☐	12. I ask a lot of questions in class	☐	☐	☐	☐	☐
☐	13. My family is helping me go to school	☐	☐	☐	☐	☐
☐	14. A college education is important to me	☐	☐	☐	☐	☐
☐	15. I want to be a technician	☐	☐	☐	☐	☐
☐	16. O.S.T. helped me get money for my education	☐	☐	☐	☐	☐
☐	17. The advice given me by Oklahoma State Tech has been helpful	☐	☐	☐	☐	☐
☐	18. I worry about grades	☐	☐	☐	☐	☐
☐	19. I plan to get a b.s. degree	☐	☐	☐	☐	☐
☐	20. I decided to go to college while in high school	☐	☐	☐	☐	☐
☐	21. My family is happy about the department i am enrolled in	☐	☐	☐	☐	☐
☐	22. A college education is important for women	☐	☐	☐	☐	☐
☐	23. My family encourages me to do well	☐	☐	☐	☐	☐
☐	24. A technical education is important to me because of its economic value	☐	☐	☐	☐	☐
☐	25. Getting an education will please my family	☐	☐	☐	☐	☐

	Don't Understand	Strongly Agree	Agree	Can't Say	Disagree	Strongly Disagree
☐ 26. I have money problems, but no one seems interested in helping		☐	☐	☐	☐	☐
☐ 27. Advice about school I have received from O.S.T. has been helpful		☐	☐	☐	☐	☐
☐ 28. The campus is too big, I don't feel comfortable here		☐	☐	☐	☐	☐
☐ 29. My study habits are good		☐	☐	☐	☐	☐
☐ 30. My family isn't interested in my grades		☐	☐	☐	☐	☐
☐ 31. I worry about my future		☐	☐	☐	☐	☐
☐ 32. My decision to go on to college was made before I was in high school		☐	☐	☐	☐	☐
☐ 33. I am **determined** to finish my education		☐	☐	☐	☐	☐
☐ 34. My family helped me decide to go to school		☐	☐	☐	☐	☐
☐ 35. It is well worth the effort to graduate		☐	☐	☐	☐	☐
☐ 36. There are other subjects besides technical subjects that I am interested in		☐	☐	☐	☐	☐
☐ 37. If I leave school, it will be due to money problems		☐	☐	☐	☐	☐
☐ 38. Going to school takes good budgeting and money management		☐	☐	☐	☐	☐
☐ 39. Friends and other students are my main source of advice about school		☐	☐	☐	☐	☐
☐ 40. I will disappoint my family if I make poor grades		☐	☐	☐	☐	☐
☐ 41. The campus is big, everything seems to be a hassel		☐	☐	☐	☐	☐
☐ 42. I don't worry about finding a job after graduation		☐	☐	☐	☐	☐
☐ 43. My grades show my ability		☐	☐	☐	☐	☐
☐ 44. A college education is not really important anymore		☐	☐	☐	☐	☐
☐ 45. Completing my education will make me feel good		☐	☐	☐	☐	☐
☐ 46. I can count on my family if a money problem comes up		☐	☐	☐	☐	☐
☐ 47. Oklahoma State Tech is close-knit, it is easy to feel like a part of the school		☐	☐	☐	☐	☐
☐ 48. My family is my main source of advice about school		☐	☐	☐	☐	☐
☐ 49. Money for my education is available		☐	☐	☐	☐	☐

	Don't Understand	Strongly Agree	Agree	C. n't Say	Disagree	Strongly Disagree
☐ 50. The campus is big, but everyone has been helpful		☐	☐	☐	☐	☐
☐ 51. My family would help me if any kind of problem come up		☐	☐	☐	☐	☐

The following asks you to rate yourself on a scale between two extremes. Check the square that you feel is nearest the position you are on each sacle

		I am	
52.	Weak	☐ ☐ ☐ ☐ ☐	Strong
53.	Passive	☐ ☐ ☐ ☐ ☐	Active
54.	Beautiful	☐ ☐ ☐ ☐ ☐	Ugly
55.	Unstable	☐ ☐ ☐ ☐ ☐	Stable
56.	Successful	☐ ☐ ☐ ☐ ☐	Failure
57.	Secure	☐ ☐ ☐ ☐ ☐	Insecure
58.	Unmotivated	☐ ☐ ☐ ☐ ☐	Motivated
59.	Positive	☐ ☐ ☐ ☐ ☐	Negative
60.	Unfriendly	☐ ☐ ☐ ☐ ☐	Friendly
61	Intelligent	☐ ☐ ☐ ☐ ☐	Dumb
62	A winner	☐ ☐ ☐ ☐ ☐	A loser
63.	Honest	☐ ☐ ☐ ☐ ☐	Dishonest
64.	Talkative	☐ ☐ ☐ ☐ ☐	Quiet
65.	Dirty	☐ ☐ ☐ ☐ ☐	Clean

Thank you for your cooperation

VITA[2]

Larry Neil Williams

Candidate for the Degree of

Doctor of Education

Thesis: A STUDY OF PERSISTING AND NONPERSISTING STUDENTS IN SELECTED VOCATIONAL-TECHNICAL PROGRAMS AT OKLAHOMA STATE TECH

Major Field: Vocational-Technical and Career Education

Biographical:

Personal Data: Born in Pauls Valley, Oklahoma, February 20, 1947, the son of Mr. and Mrs. John Wilson Williams.

Education: Graduated from Pauls Valley High School, Pauls Valley, Oklahoma, in 1965; received the Bachelor of Science in Education degree from East Central Oklahoma State University in 1969; received the Master of Education degree with a major in Guidance and Counseling in 1973 from East Central Oklahoma State University; completed requirements for the Doctor of Education degree at Oklahoma State University in May, 1979.

Professional Experience: Teacher, Sasakwa Public Schools, Sasakwa, Oklahoma, 1969-1970; Personnel Specialist, United States Army, Fort Knox, Kentucky, Washington D.C., Vicenza, Italy, 1970-1971; Sales Representative, Perkins Lumber Company, Pauls Valley, Oklahoma 1971-1973; General Education Instructor, Oklahoma State Tech, Okmulgee, Oklahoma, 1973-1974; Field Counselor, Oklahoma State Tech, Okmulgee, Oklahoma, 1974-1977; Administrative Assistant, Oklahoma State Tech, Okmulgee, Oklahoma, 1977-1979; Coordinator, Admissions and Counseling, Oklahoma State Tech, Okmulgee, Oklahoma, 1979-present.

Professional Organizations: Oklahoma Personnel and Guidance Association, American Personnel and Guidance Association, Oklahoma College Personnel Association, Oklahoma Technical Society.